IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Application of

CHING-YU LIN, *et al.*

Filed: June 20, 2001

Serial No.: 09/885,799

For: METHOD AND DETECTOR FOR IDENTIFYING SUBTYPES OF HUMAN PAPILLOMA VIRUSES

Examiner: Myers, Carla J.

Group Art Unit: 1634

DECLARATION OF DR. TANG-YUAN CHU UNDER RULE 1.132

I, Tang-Yuan Chu, hereby declare that:

1. All statements made herein of my own knowledge are true and all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, of both, under Section 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of this application or any patent issuing thereon.

2. I am Dean, Graduate Institute of Medical Sciences, National Defense Medical Center, R.O.C. A full and accurate account of my qualifications including education, publications, titles, and awards, for example, is presented in my *curriculum vitae* (C.V.) as an appendix attached hereto.

3. I have intensively studied HPV Papilloma virus subtypes and their association with cervical cancer. I have authored, for example, professional peer-reviewed publications including but not limited to the following, for example:

1. Lai HC, Sun JA, Yu MS, Chen HC, Liu HS, Chu TY* (1999) Favorable clinical outcomes of cervical cancers infected with human papillomavirus type 58 and its related types. Int J Cancer, 84: 553-557. (SCI)
2. Sun CA, Yang CJ, Chu TY, Hsieh CY, You SL, Yu MH (2000). Misclassification of human papillomavirus infection in epidemiological studies: Nature and consequences. J Med Sci; 20:333-341.
3. Sun CA, Chu TY, Yang CJ, Wu DM, Hsieh CY, You SL, Yu MH. (2000) Understanding the epidemiology of genital human papillomavirus infection in women: Importance of data on type-specific infections. J Med Sci ;20:470-480.
4. Sun CA, Lai HC, Chang CC, Neih S, Yu CP and Chu TY* (2001) The significance of HPV viral load in prediction of histological severity and size of squamous intraepithelial lesions of uterine cervix. Gynecol Oncolog, 83: 95-99. (SCI)
5. Sun CA, Liu JF, Wu DM, Neih S, Yu CP, Chu TY*(2002). Viral load of high-risk human papillomavirus in cervical squamous intraepithelial lesions: A hospital-based case-control study in Taiwan. Int J Gynaecol Obstet. 76(1):41-47 (SCI)
6. Chu TY*, Hwang KS, Yu MH, Chen HJ, Lee HS, Lai HC and Liu JY (2002) A research-based gynecologic tumor tissue bank for molecular oncology: characteristics of of nucleic acids extracted from normal and tumor tissues from different sites. Int J of Gyncol Cancer, 12: 171-176 (SCI)
7. Lai HC, Stywu HK, Sun CA, Yu MH, Yu CP, Liu HS, Chang CC , Chu TY* (2002) Single nucleotide polymorphism at *FAS* promoter is associated with cervical carcinogenesis, Int J Cancer, 2003 Jan 10;103(2):221-5.
8. Lai HC, Peng MY, Huang RL, Lin JY, Chu TY (2002) HPV detection and genotyping: comparison of current and emerging methodologies: Hybrid Capture, PCR-reverse line blot and PCR-HPV gene chip. 2002 Annual Meeting of the Taiwan Association of Obstetrics and Gynecology, Taipei.
9. Chu TY (2002) Human papillomavirus diseases: the spectrum of clinical diagnosis. Invited speech at "Consensus Conference in Cervical Pathology" of Taiwan Association of Pathology; Kao-Shung, Taiwan.
10. Chu TY (2002) Combination of HPV testing and Pap smear in screening of cervical cancer: Cost- effectiveness assessment in Taiwan. 2002; Joint Conference of Cancer, Taiwan.
11. Chu TY (2002) Clinical cohort and tissue banking: the key of translating genomic research. Invited Speech at Ma-Kai Memorial Hospital and Veteran General Hospital, Taipei.
12. Chu TY (2002) Human papillomavirus and Cervical Cancer: Toward the

novel diagnostic and preventive measures in Taiwan. Invited speech at National Chen-Gong University Medical College

13. Chu TY, Hsieh HC, Sun CA, Lai HC, Chao CF (2002) Genetic polymorphisms of metabolizing genes and risk of cervical cancer development. Ninth Bianual Meeting of International Gynecologic Cancer Society. Seoul, Korea.
14. ChuTY, Sun CA, Yu CP, Yu MH (2002) Toward a comprehensive genetic diagnosis of cervical cancer. In 2nd Conference on Cancer Genomics of NHRI, Tao-Yuan, Taiwan.
15. ChuTY (2002) HNPCC: Genetic characterization and diagnosis. In Sixth Annual Meeting of Taiwan Cooperative Oncology Group, NHRI, Taipei.

4. By training and experience, accordingly, I am familiar with the nucleic acid molecular characteristics of HPV Papilloma virus subtypes.

5. I am familiar with the statements in the present file of United States Application Serial No. 09/885,799, the specification, the claims, as well as the Amendment being filed with this Declaration.

6. I am not an inventor on the above-identified pending application.

7. I am familiar with the sequences of human papilloma virus subtypes that were described in the original application (U.S. Serial No. 09/855,799, filed June 20, 2001) by HPV subtype, NCBI Accession number, and loci (reproduced in Table I as follows):

Table I

HPV subtype	Accession number/bp	loci /bp
HPV 11	NC 001525/7931	6727 - 7135/409
HPV 16	NC 001526/7904	6602 - 7013/412
HPV 18	NC 001357/7857	6578 - 6992/415
HPV 26	NC 001583/7855	6553 - 6967/415
HPV 31	NC 001527/7912	6520 - 6931/412

HPV 32	NC 001586/7961	6837 - 7245/409
HPV 33	NC 001528/7909	6559 - 6967/409
HPV 35	NC 001529/7851	6542 - 6953/412
HPV 37	NC 001687/7421	6711 - 7125/415
HPV 39	NC 001535/7833	6605 - 7019/415
HPV 42	NC 001534/7917	6802-7210/409
HPV 43	U12504/455	21-435/415
HPV 44	NC 001689/7833	6647 - 7061/415
HPV 45	NC 001590/7858	6582 - 6996/415
HPV 51	NC 001533/7808	6486 - 6897/412
HPV 52	NC 001592/7942	6623 - 7031/409
HPV 53	NC 001593/7856	6614 - 7022/409
HPV 54	NC 001676/7759	6561 - 6972/412
HPV 56	NC 001594/7844	6559 - 6967/409
HPV 58	NC 001443/7824	6608 - 7016/409
HPV 59	NC 001635/7896	6571 - 6985/415
HPV 61	NC 001694/7989	6732 - 7146/415
HPV 62	U12499/449	21 - 429/409
HPV 66	NC 001695/7824	6609 - 7017/409
HPV 67	D21208/7801	6584 - 6992/409
HPV 68	M73258/6042	2582 - 2996/415
HPV 69	NC 002171/7700	6509 - 6923/415
HPV 6	NC 000904/8012	6743 - 7151/409
HPV 70	NC 001711/7905	6549 - 6963/415

HPV 72	X94164/7988	6758 - 7172/415
HPV 74	U40822/3891	1613 - 2027/415
HPV 82	AB027021/7871	6536 - 6950/415
HPV CP8061	U12479/452	21 - 432/412
HPV CP8304	U12480/452	21 - 432/412
HPV L1AE5	AF039910/364	11 - 360/350
HPV MM4	U12488/455	21 - 435/415
HPV MM7	U12489/452	21 - 432/412
HPV MM8	U12490/452	21 - 432/412

8. I herein confirm and attest to the fact that each of these sequences was published and publicly available on June 20, 2001, for example, from the National Center for Biotechnology Information (NCBI) (e.g., www.ncbi.nih.gov).

9. I further confirm and attest to the fact that each of the sequences described in Table I, *supra*, particularly identified by NCBI Accession number and loci, as published June 20, 2001, are in fact identical respectively to the sequences, i.e., SEQ ID NO:651- SEQ ID NO:688, reproduced herein as follows, now recited in the Sequence Listing of the subject pending United States Patent Application Serial No. 09/855,799, and referred to in now pending claim 13.

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HPV 11      6727 - 7135/409 bp
TATTTGCTGG GGAAACCACT TGTTTGTTAC TGTGGTAGAT ACCACACGCA GTACAAATAT     60
GACACTATGT GCATCTGTGT CTAAATCTGC TACATACACT AATTCAGATT ATAAGGAATA    120
CATGCGCCAT GTGGAGGAGT TTGATTTACA GTTTATTTTT CAATTGTGTA GCATTACATT    180
ATCTGCAGAA GTCATGGCCT ATATACACAC AATGAATCCT TCTGTTTTGG AGGACTGGAA    240
CTTTGGTTTA TCGCCTCCAC CAAATGGTAC ACTGGAGGAT ACTTATAGAT ATGTACAGTC    300
ACAGGCCATT ACCTGTCAGA AACCCACACC TGAAAAAGAA AAACAGGATC CCTATAAGGA    360
TATGAGTTTT TGGGAGGTTA ACTTAAAAGA AAAGTTTTCA AGTGAATTA                409
(SEQ ID NO: 651);
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HPV 16 6602 - 7013/412 bp
CATTTGTTGG GGTAACCAAC TATTTGTTAC TGTTGTTGAT ACTACACGCA GTACAAATAT 60
GTCATTATGT GCTGCCATAT CTACTTCAGA AACTACATAT AAAAATACTA ACTTTAAGGA 120
GTACCTACGA CATGGGGAGG AATATGATTT ACAGTTTATT TTTCAACTGT GCAAAATAAC 180
CTTAACTGCA GACGTTATGA CATACATACA TTCTATGAAT TCCACTATTT TGGAGGACTG 240
GAATTTTGGT CTACAACCTC CCCCAGGAGG CACACTAGAA GATACTTATA GGTTTGTAAC 300
CCAGGCAATT GCTTGTCAAA AACATACACC TCCAGCACCT AAAGAAGATG ATCCCCTTAA 360
AAAATACACT TTTTGGGAAG TAAATTTAAA GGAAAAGTTT TCTGCAGACC TA 412
(SEQ ID NO: 652);

HPV 18 6578 - 6992/415 bp
TGTTTGCTGG CATAATCAAT TATTTGTTAC TGTGGTAGAT ACCACTCCCA GTACCAATTT 60
AACAATATGT GCTTCTACAC AGTCTCCTGT ACCTGGGCAA TATGATGCTA CCAAATTTAA 120
GCAGTATAGC AGACATGTTG AGGAATATGA TTTGCAGTTT ATTTTTCAGT TGTGTACTAT 180
TACTTTAACT GCAGATGTTA TGTCCTATAT TCATAGTATG AATAGCAGTA TTTTAGAGGA 240
TTGGAACTTT GGTGTTCCCC CCCCCCCAAC TACTAGTTTG GTGGATACAT ATCGTTTTGT 300
ACAATCTGTT GCTATTACCT GTCAAAAGGA TGCTGCACCG GCTGAAAATA AGGATCCCTA 360
TGATAAGTTA AAGTTTTGGA ATGTGGATTT AAAGGAAAAG TTTTCTTTAG ACTTA 415
(SEQ ID NO: 653);

HPV 26 6553 - 6967/415 bp
TATCTGTTGG GGCAATCAAT TGTTTGTTAC CTGTGTTGAT ACCACCCGCA GTACTAACCT 60
TACCATTAGT ACATTATCTG CAGCATCTGC ATCCACTCCA TTTAAACCAT CTGATTATAA 120
ACAATTTATA AGACATGGCG AAGAATATGA ATTACAATTT ATATTTCAGT TGTGTAAAAT 180
AACACTTACA ACAGATGTTA TGGCTTACAT ACATTTAATG AATGCCTCCA TATTGGAGGA 240
TTGGAATTTT GGACTAACCT TACCTCCCAC TGCTAGTTTG GAAGATGCCT ATAGGTTTAT 300
TAAAAACTCT GCTACTACCT GTCAGCGTAA CGCCCCTCCT GTGCCAAAGG AAGATCCTTT 360
TCAAAAATTT AAATTTTGGG ATGTAGATTT AAAAGAAAAA TTTTCTATTG ATTTG 415
(SEQ ID NO: 654);

HPV 31 6520 - 6931/412 bp
TATTTGTTGG GGCAATCAGT TATTTGTTAC TGTGGTAGAT ACCACACGTA GTACCAATAT 60
GTCTGTTTGT GCTGCAATTG CAAACAGTGA TACTACATTT AAAAGTAGTA ATTTTAAAGA 120
GTATTTAAGA CATGGTGAGG AATTTGATTT ACAATTTATA TTTCAGTTAT GCAAAATAAC 180
ATTATCTGCA GACATAATGA CATATATTCA CAGTATGAAT CCTGCTATTT TGGAAGATTG 240
GAATTTTGGA TTGACCACAC CTCCCTCAGG TTCTTTGGAG GATACCTATA GGTTTGTCAC 300
CTCACAGGCC ATTACATGTC AAAAAACTGC CCCCCAAAAG CCCAAGGAAG ATCCATTTAA 360
AGATTATGTA TTTTGGGAGG TTAATTTAAA AGAAAAGTTT TCTGCAGATT TA 412
(SEQ ID NO: 655);

HPV 32 6837 - 7245/409 bp
TATATGTTGG GGTAATCAAG TGTTTCTAAC TGTTGTGGAT ACTACCCGTA GTACTAACAT 60
GACTGTGTGT GCTACTGTAA CAACTGAAGA CACATACAAG TCTACTAACT TTAAGGAATA 120
TCTACGCCAT GCAGAGGAAT ATGATATACA GTTTATATTT CAATTGTGCA AAATTACATT 180
ATCTGTAGAG GTTATGTCAT ATATCCACAC CATGAATCCT GACATACTAG ACGATTGGAA 240
TGTTGGTGTA GCTCCACCGC CCTCTGGTAC TTTAGAAGAT AGTTATAGAT TTGTGCAGTC 300
TCAGGCCATA CGATGTCAAG CTAAGGTAAC AGCACCTGAA AAAAAGGATC CTTTTTCTGA 360
CTATTCATTT TGGGAAGTAA ATTTATCTGA AAAGTTTTCT AGTGATTTA 409
(SEQ ID NO: 656);

HPV 33 6559 - 6967/409 bp

TATTTGTTGG GGCAATCAGG TATTTGTTAC TGTGGTAGAT ACCACTCGCA GTACTAATAT 60
GACTTTATGC ACACAAGTAA CTAGTGACAG TACATATAAA AATGAAAATT TTAAAGAATA 120
TATAAGACAT GTTGAAGAAT ATGATCTACA GTTTGTTTTT CAACTATGCA AAGTTACCTT 180
AACTGCAGAA GTTATGACAT ATATTCATGC TATGAATCCA GATATTTTAG AAGATTGGCA 240
ATTTGGTTTA ACACCTCCTC CATCTGCTAG TTTACAGGAT ACCTATAGGT TTGTTACCTC 300
TCAGGCTATT ACGTGTCAAA AAACAGTACC TCCAAAGGAA AAGGAAGACC CCTTAGGTAA 360
ATATACATTT TGGGAAGTGG ATTTAAAGGA AAAATTTTCA GCAGATTTA 409
(SEQ ID NO: 657);

HPV 35 6542 - 6953/412 bp
TATTTGTTGG AGTAACCAAT TGTTTGTTAC TGTAGTTGAT ACAACCCGTA GTACAAATAT 60
GTCTGTGTGT TCTGCTGTGT CTTCTAGTGA CAGTACATAT AAAAATGACA ATTTTAAGGA 120
ATATTTAAGG CATGGTGAAG AATATGATTT ACAGTTTATT TTTCAGTTAT GTAAAATAAC 180
ACTAACAGCA GATGTTATGA CATATATTCA TAGTATGAAC CCGTCCATTT TAGAGGATTG 240
GAATTTTGGC CTTACACCAC CGCCTTCTGG TACCTTAGAG GACACATATC GCTATGTAAC 300
ATCACAGGCT GTAACTTGTC AAAAACCCAG TGCACCAAAA CCTAAAGATG ATCCATTAAA 360
AAATTATACT TTTTGGGAGG TTGATTTAAA GGAAAAGTTT TCTGCAGACT TA 412
(SEQ ID NO: 658);

HPV 37 6711 - 7125/415 bp
CATTTTATGG GGTAATCAAA TGTTTATCAC AGTTGCTGAT AATACACGGA ACACAAACTT 60
TTCTATTAGT GTGTCTACTG ACAATGGCGA AGTTACAGAA TATAATTCTC AAACACTCAG 120
AGAATACCTA AGACATGTTG AAGAATACCA GCTTTCAATT ATTTTACAAC TTTGTAAAGT 180
TCCTTTAAAG GCTGAGGTTT TAACTCAGAT AAATGCAATG AATTCTGGTA TATTGGAAGA 240
GTGGCAATTA GGATTTGTAC CTACTCCAGA TAATTCAGTA CATGACCTTT ATAGGTACAT 300
TAATTCAAAG GCTACCAAGT GTCCTGATGC AGTTGTTGAA AAAGAAAAGG AAGATCCCTT 360
TGCAAAATAT ACATTTTGGA ATGTAGATTT AACTGAAAAA TTATCATTGG ATTTA 415
(SEQ ID NO: 659);

HPV 39 6605 - 7019/415 bp
TATATGTTGG CATAATCAAT TATTTCTTAC TGTTGTGGAC ACTACCCGTA GTACCAACTT 60
TACATTATCT ACCTCTATAG AGTCTTCCAT ACCTTCTACA TATGATCCTT CTAAGTTTAA 120
GGAATATACC AGGCACGTGG AGGAGTATGA TTTACAATTT ATATTTCAAC TGTGTACTGT 180
CACATTAACA ACTGATGTTA TGTCTTATAT TCACACTATG AATTCCTCTA TATTGGACAA 240
TTGGAATTTT GCTGTAGCTC CTCCACCATC TGCCAGTTTG GTAGACACTT ACAGATACCT 300
ACAGTCTGCA GCCATTACAT GTCAAAAGGA TGCTCCAGCA CCTGAAAAGA AAGATCCATA 360
TGACGGTCTA AAGTTTTGGA ATGTTGACTT AAGGGAAAAG TTTAGTTTGG AACTT 415
(SEQ ID NO: 660);

HPV 42 6802-7210/409 bp
TATATGTTGG GGAAATCAGC TATTTTTAAC TGTGGTTGAT ACTACCCGTA GTACTAACAT 60
GACTTTGTGT GCCACTGCAA CATCTGGTGA TACATATACA GCTGCTAATT TTAAGGAATA 120
TTTAAGACAT GCTGAAGAAT ATGATGTGCA ATTTATATTT CAATTGTGTA AAATAACATT 180
AACTGTTGAA GTTATGTCAT ATATACACAA TATGAATCCT AACATATTAG AGGAGTGGAA 240
TGTTGGTGTT GCACCACCAC CTTCAGGAAC TTTAGAAGAT AGTTATAGGT ATGTACAATC 300
AGAAGCTATT CGCTGTCAGG CTAAGGTAAC AACGCCAGAA AAAAAGGATC CTTATTCAGA 360
CTTTTGGTTT TGGGAGGTAA ATTTATCTGA AAAGTTTTCT ACTGATTTA 409
(SEQ ID NO: 661);

HPV 43 21-435/415 bp
CATTTGTTTT GGGAATCAGT TGTTTGTTAC AGTGGTAGAT ACCACTCGTA GTACAAACTT 60
GACGTTATGT GCCTCTACTG ACCCTACTGT GCCCAGTACA TATGACAATG CAAAGTTTAA 120
GGAATACTTG CGGCATGTGG AAGAATATGA TCTGCAGTTT ATATTTCAAT TATGCATAAT 180

AACGCTAAAC CCAGAGGTTA TGACATATAT TCATACTATG GATCCCACAT TATTAGAGGA 240
CTGGAATTTT GGTGTGTCCC CACCTGCCTC TGCTTCTTTG GAAGATACTT ATCGCTTTTT 300
GTCTAACAAG GCCATTGCAT GTCAAAAAAA TGCTCCCCCA AAGGAACGGG AGGATCCCTA 360
TAAAAAGTAT ACATTTTGGG ATATAAATCT TACAGAAAAG TTTTCTGCAC AACTT 415
(SEQ ID NO: 662);

HPV 44 6647 - 7061/415 bp
TATTTGTTGG GGAAATCAGT TATTTGTTAC TGTTGTAGAT ACTACCCGTA GTACAAACAT 60
GACAATATGT GCTGCCACTA CACAGTCCCC TCCGTCTACA TATACTAGTG AACAATATAA 120
GCAATACATG CGACATGTTG AGGAGTTTGA CTTACAATTT ATGTTTCAAT TATGTAGTAT 180
TACCTTAACG GCGGAGGTAA TGGCCTATCT TCATACTATG AATGCTGGTA TTTTAGAACA 240
GTGGAACTTT GGGTTGTCGC CGCCCCCAAA TGGTACCTTA GAGGACAAAT ACAGATATGT 300
GCAGTCCCAG GCCATTACAT GTCAAAAGCC ACCCCCTGAA AAGGCAAAGC AGGACCCCTA 360
TGCAAAATTA AGTTTTTGGG AGGTGGATCT TAGAGAAAAG TTTTCTAGTG AGTTG 415
(SEQ ID NO: 663);

HPV 45 6582 - 6996/415 bp
TATTTGTTGG CATAATCAGT TGTTTGTTAC TGTAGTGGAC ACTACCCGCA GTACTAATTT 60
AACATTATGT GCCTCTACAC AAAATCCTGT GCCAAGTACA TATGACCCTA CTAAGTTTAA 120
GCAGTATAGT AGACATGTGG AGGAATATGA TTTACAGTTT ATTTTTCAGT TGTGCACTAT 180
TACTTTAACT GCAGAGGTTA TGTCATATAT CCATAGTATG AATAGTAGTA TATTAGAAAA 240
TTGGAATTTT GGTGTCCCTC CACCACCTAC TACAAGTTTG GTGGATACAT ATCGTTTTGT 300
GCAATCAGTT GCTGTTACCT GTCAAAAGGA TACTACACCT CCAGAAAAGC AGGATCCATA 360
TGATAAATTA AAGTTTTGGA CTGTTGACCT AAAGGAAAAA TTTTCCTCCG ATTTG 415
(SEQ ID NO: 664);

HPV 51 6486 - 6897/412 bp
CATTTGCTGG AACAATCAGC TTTTTATTAC CTGTGTTGAT ACTACCAGAA GTACAAATTT 60
AACTATTAGC ACTGCCACTG CTGCGGTTTC CCCAACATTT ACTCCAAGTA ACTTTAAGCA 120
ATATATTAGG CATGGGGAAG AGTATGAATT GCAATTTATT TTTCAATTAT GTAAAATTAC 180
TTTAACTACA GAGGTAATGG CTTATTTACA CACAATGGAT CCTACCATTC TTGAACAGTG 240
GAATTTTGGA TTAACATTAC CTCCGTCTGC TAGTTTGGAG GATGCATATA GGTTTGTTAG 300
AAATGCAGCT ACTAGCTGTC AAAAGGACAC CCCTCCACAG GCTAAGCCAG ATCCTTTGGC 360
CAAATATAAA TTTTGGGATG TTGATTTAAA GGAACGATTT TCTTTAGATT TA 412
(SEQ ID NO: 665);

HPV 52 6623 - 7031/409 bp
CATATGTTGG GGCAATCAGT TGTTTGTCAC AGTTGTGGAT ACCACTCGTA GCACTAACAT 60
GACTTTATGT GCTGAGGTTA AAAAGGAAAG CACATATAAA AATGAAAATT TTAAGGAATA 120
CCTTCGTCAT GGCGAGGAAT TTGATTTACA ATTTATTTTT CAATTGTGCA AAATTACATT 180
AACAGCTGAT GTTATGACAT ACATTCATAA GATGGATGCC ACTATTTTAG AGGACTGGCA 240
ATTTGGCCTT ACCCCACCAC CGTCTGCATC TTTGGAGGAC ACATACAGAT TTGTCACTTC 300
TACTGCTATA ACTTGTCAAA AAAACACACC ACCTAAAGGA AAGGAAGATC CTTTAAAGGA 360
CTATATGTTT TGGGAGGTGG ATTTAAAAGA AAAGTTTTCT GCAGATTTA 409
(SEQ ID NO: 666);

HPV 53 6614 - 7022/409 bp
CATCTGTTGG AACAATCAGT TATTTGTAAC TGTTGTGGAT ACCACCAGGA ATACAAACAT 60
GACTCTTTCC GCAACCACAC AGTCTATGTC TACATATAAT TCAAAGCAAA TTAAACAGTA 120
TGTTAGACAT GCAGAGGAAT ATGAATTACA ATTTGTGTTT CAACTATGTA AAATATCCCT 180
GTCTGCTGAG GTTATGGCCT ATTTACATAC TATGAATTCT ACCTTACTGG AAGACTGGAA 240
TATAGGTTTG TCGCCTCCTG TTGCCACTAG CTTAGAGGAC AAATACAGAT ATGTGAAAAG 300
TGCAGCTATA ACCTGTCAAA AGGATCAGCC CCCTCCTGAA AAGCAGGACC CACTATCTAA 360

ATATAAATTT TGGGAGGTCA ATTTGCAAAA CAGTTTTTCT GCTGATTTG 409
(SEQ ID NO: 667);

HPV 54 6561 - 6972/412 bp
TATTTGTTGG GGCAATCAGG TGTTTTTAAC AGTTGTAGAT ACCACCCGTA GTACTAACCT 60
AACATTGTGT GCTACAGCAT CCACGCAGGA TAGCTTTAAT AATTCTGACT TTAGGGAGTA 120
TATTAGACAT GTGGAGGAAT ATGATTTACA GTTTATATTT CAGTTATGTA CCATAACCCT 180
TACAGCAGAT GTTATGGCCT ATATTCATGG AATGAATCCC ACTATTCTAG AGGACTGGAA 240
CTTTGGTATA ACCCCCCCAG CTACAAGTAG TTTGGAGGAC ACATATAGGT TTGTACAGTC 300
ACAGGCCATT GCATGTCAAA AGAATAATGC CCCTGCAAAG GAAAAGGAGG ATCCTTACAG 360
TAAATTTAAT TTTTGGACTG TTGACCTTAA GGAACGATTT TCATCTGACC TT 412
(SEQ ID NO: 668);

HPV 56 6559 - 6967/409 bp
CATTTGCTGG GGTAATCAAT TATTTGTTAC TGTAGTAGAT ACTACTAGAA GTACTAACAT 60
GACTATTAGT ACTGCTACAG AACAGTTAAG TAAATATGAT GCACGAAAAA TTAATCAGTA 120
CCTTAGACAT GTGGAGGAAT ATGAATTACA ATTTGTTTTT CAATTATGCA AAATTACTTT 180
GTCTGCAGAG GTTATGGCAT ATTTACATAA TATGAATGCT AACCTACTGG AGGACTGGAA 240
TATTGGGTTA TCCCCGCCAG TGGCCACCAG CCTAGAAGAT AAATATAGAT ATGTTAGAAG 300
CACAGCTATA ACATGTCAAC GGGAACAGCC ACCAACAGAA AAACAGGACC CATTAGCTAA 360
ATATAAATTT TGGGATGTTA ACTTACAGGA CAGTTTTTCT ACAGACCTGG ATCAATTTC 419
(SEQ ID NO: 669);

HPV 58 6608 - 7016/409 bp
CATTTGCTGG GGCAATCAGT TATTTGTTAC CGTGGTTGAT ACCACTCGTA GCACTAATAT 60
GACATTATGC ACTGAAGTAA CTAAGGAAGG TACATATAAA AATGATAATT TTAAGGAATA 120
TGTACGTCAT GTTGAAGAAT ATGACTTACA GTTTGTTTTT CAGCTTTGCA AAATTACACT 180
AACTGCAGAG ATAATGACAT ATATACATAC TATGGATTCC AATATTTTGG AGGACTGGCA 240
ATTTGGTTTA ACACCTCCTC CGTCTGCCAG TTTACAGGAC ACATATAGAT TTGTTACCTC 300
CCAGGCTATT ACTTGCCAAA AAACAGCACC CCCTAAAGAA AAGGAAGATC CATTAAATAA 360
ATATACTTTT TGGGAGGTTA ACTTAAAGGA AAAGTTTTCT GCAGATCTA 409
(SEQ ID NO: 670);

HPV 59 6571 - 6985/415 bp
TATATGTTGG CACAATCAAT TGTTTTTAAC AGTTGTAGAT ACTACTCGCA GCACCAATCT 60
TTCTGTGTGT GCTTCTACTA CTTCTTCTAT TCCTAATGTA TACACACCTA CCAGTTTTAA 120
AGAATATGCC AGACATGTGG AGGAATTTGA TTTGCAGTTT ATATTTCAAC TGTGTAAAAT 180
AACATTAACT ACAGAGGTAA TGTCATACAT TCATAATATG AATACCACTA TTTTGGAGGA 240
TTGGAATTTT GGTGTTACAC CACCTCCTAC TGCTAGTTTA GTTGACACAT ACCGTTTTGT 300
TCAATCTGCT GCTGTAACTT GTCAAAAGGA CACCGCACCG CCAGTTAAAC AGGACCCTTA 360
TGACAAACTA AAGTTTTGGC CTGTAGATCT TAAGGAAAGG TTTTCTGCAG ATCTT 415
(SEQ ID NO: 671);

HPV 61 6732 - 7146/415 bp
TATTTGTTGG TTTAATGAAT TGTTTGTAAC CGTTGTGGAT ACCACCCGCA GTACTAATTT 60
AACCATTTGT ACTGCTACAT CCCCCCCTGT ATCTGAATAT AAAGCCACAA GCTTTAGGGA 120
ATATTTGCGC CATACAGAGG AGTTTGATTT GCAATTTATT TTTCAGTTAT GTAAAATACA 180
TTTAACCCCT GAAATTATGG CCTACCTACA TAATATGAAT AAGGCCTTGT TGGATGACTG 240
GAACTTTGGT GTGGTACCAC CACCCTCTAC CAGTTTAGAA GACACATATA GGTTTTTGCA 300
GTCCAGAGCT ATTACATGTC AGAAGGGTGC TGCTGCCCCG CCGCCCAAGG AGGATCGCTA 360
TGCCAAGTTA TCCTTTTGGA CTGTTGATTT ACGAGACAAG TTTTCCACTG ATTTG 415
((SEQ ID NO: 672);

HPV 62 21 - 429/409 bp
TATTTGTTGG TTTAATGAAC TGTTTGTTAC TGTGGTGGAT ACTACCAGAA GTACTAATTT 60
TACTATTTGT ACCGCCTCCA CTGCTGCAGC AGAATACACG GCTACCAACT TTAGGGAATT 120
TTTGCGACAC ACGGAGGAAT TTGATTTGCA ATTTATATTT CAATTGTGCA AAATACAGTT 180
AACCCCCGAA ATTATGGCCT ACCTGCATAA TATGAACAAG GACCTTTTGG ATGACTGGAA 240
CTTTGGGGTT TTACCTCCCC CTTCCACTAG TTTAGATGAG ACATATCACT ATTTCGAGTC 300
TCGGGCTATT ACATGTCAAA GGGGGCTGCC TACCCGTCCC AAGGTGGACC CGTATGCGCA 360
AATGACATTT TGGACTGTGG ATCTTAAGGA CAAGTTGTCT ACTGATTTG 409
(SEQ ID NO: 673);

HPV 66 6609 - 7017/409 bp
CATATGCTGG GGTAATCAGG TATTTGTTAC TGTTGTGGAT ACTACCAGAA GCACCAACAT 60
GACTATTAAT GCAGCTAAAA GCACATTAAC TAAATATGAT GCCCGTGAAA TCAATCAATA 120
CCTTCGCCAT GTGGAGGAAT ATGAACTACA GTTTGTGTTT CAACTTTGTA AAATAACCTT 180
AACTGCAGAA GTTATGGCAT ATTTGCATAA TATGAATAAT ACTTTATTAG ACGATTGGAA 240
TATTGGCTTA TCCCCACCAG TTGCAACTAG CTTAGAGGAT AAATATAGGT ATATTAAAAG 300
CACAGCTATT ACATGTCAGA GGGAACAGCC CCCTGCAGAA AAGCAGGATC CCCTGGCTAA 360
ATATAAGTTT TGGGAAGTTA ATTTACAGGA CAGCTTTTCT GCAGACCTG 409
(SEQ ID NO: 674);

HPV 67 6584 - 6992/409 bp
TATATGCTGG GGTAATCAAA TATTTGTTAC TGTTGTAGAC ACTACACGTA GTACCAACAT 60
GACTTTATGT TCTGAGGAAA AATCAGAGGC TACATACAAA AATGAAAACT TTAAGGAATA 120
CCTTAGACAT GTGGAAGAAT ATGATTTGCA GTTTATATTT CAGCTGTGCA AAATATCCCT 180
TACTGCAAAT GTTATGCAAT ACATACACAC CATGAATCCA GATATATTAG AGGACTGGCA 240
ATTTGGCCTT ACACCACCTC CTTCAGGTAA TTTACAGGAC ACATATAGAT TTGTTACCTC 300
GCAGGCTATT ACCTGTCAAA AAACATCCCC TCCAACAGCA AAGGAAGATC CTCTTAAAAA 360
GTACAGTTTT TGGGAAATCA ATTTAAAGGA AAAATTTTCT GCAGATTTA 409
(SEQ ID NO: 675);

HPV 68 2582 - 2996/415 bp
TATTTGTTGG CATAATCAAT TATTTCTTAC TGTTGTGGAT ACCACTCGCA GTACCAATTT 60
TACTTTGTCT ACTACTACTG AATCAGCTGT ACCAAATATT TATGATCCTA ATAAATTTAA 120
GGAATATATT AGGCATGTTG AGGAATATGA TTTGCAATTT ATATTTCAGT TGTGTACTAT 180
AACATTGTCC ACTGATGTAA TGTCCTATAT ACATACTATG AATCCTGCTA TTTTGGATGA 240
TTGGAATTTT GGTGTTGCCC CTCCACCATC TGCTAGTCTT GTAGATACAT ACCGCTATCT 300
GCAATCAGCA GCAATTACAT GTCAAAAAGA CGCCCCTGCA CCTACTAAAA AGGATCCATA 360
TGATGGCTTA AACTTTTGGA ATGTAAATTT AAAGGAAAAG TTTAGTTCTG AACTG 415
(SEQ ID NO: 676);

HPV 69 6509 - 6923/415 bp
CATTTGTTGG GGCAACCAAT TGTTTGTTAC TTGTGTAGAT ACTACCCGCA GTACCAACCT 60
CACTATTAGT ACTGTATCTG CACAATCTGC ATCTGCCACT TTTAAACCAT CAGATTATAA 120
GCAGTTTATA AGGCATGGTG AGGAATATGA ATTACAGTTT ATATTTCAAT TGTGTAAAAT 180
TACTCTTACC ACTGATGTAA TGGCCTATAT CCATACAATG AATTCTACTA TTTTGGAAAA 240
TTGGAATTTT GGCCTTACCT TGCCTCCTAC TGCTAGTTTG GAAGATGCAT ATAGGTTTAT 300
TAAAAATTCA GCTACTACAT GTCAACGCGA TGCCCCTGCA CAGCCCAAGG AGGATCCATT 360
TAGTAAATTA AAATTTTGGG ACGTTGATCT TAAAGAAAAG TTTTCTATTG ATTTA 415
(SEQ ID NO: 677);

HPV 6 6743 - 7151/409 bp
TATTTGTTGG GGTAATCAAC TGTTTGTTAC TGTGGTAGAT ACCACACGCA GTACCAACAT 60

GACATTATGT GCATCCGTAA CTACATCTTC CACATACACC AATTCTGATT ATAAAGAGTA 120
CATGCGTCAT GTGGAAGAGT ATGATTTACA ATTTATTTTT CAATTATGTA GCATTACATT 180
GTCTGCTGAA GTAATGGCCT ATATTCACAC AATGAATCCC TCTGTTTTGG AAGACTGGAA 240
CTTTGGGTTA TCGCCTCCCC CAAATGGTAC ATTAGAAGAT ACCTATAGGT ATGTGCAGTC 300
ACAGGCCATT ACCTGTCAAA AGCCCACTCC TGAAAAGGAA AAGCCAGATC CCTATAAGAA 360
CCTTAGTTTT TGGGAGGTTA ATTTAAAAGA AAAGTTTTCT AGTGAATTG 409
(SEQ ID NO: 678);

HPV 70 6549 - 6963/415 bp
CATTTGTTGG CATAACCAGT TGTTTATTAC TGTGGTGGAC ACTACACGTA GTACTAATTT 60
TACATTGTCT GCCTGCACCG AAACGGCCAT ACCTGCTGTA TATAGCCCTA CAAAGTTTAA 120
GGAATATACT AGGCATGTGG AGGAATATGA TTTACAATTT ATATTTCAAT TGTGTACTAT 180
CACATTAACT GCTGACGTTA TGGCCTACAT CCATACTATG AATCCTGCAA TTTTGGACAA 240
TTGGAATATA GGAGTTACCC CTCCACCATC TGCAAGCTTG GTGGACACGT ATAGGTATTT 300
ACAATCAGCA GCTATAGCAT GTCAAAAGGA TGCTCCTACA CCTGAAAAAA AGGATCCCTA 360
TGACGATTTA AAATTTTGGA ATGTTGATTT AAAGGAAAAG TTTAGTACAG AACTA 415
(SEQ ID NO: 679);

HPV 72 6758 - 7172/415 bp
CATCTGTTGG TTTAATGAGC TTTTTGTGAC AGTTGTAGAT ACTACTCGCA GTACTAATGT 60
AACTATTTGT ACTGCCACAG CGTCCTCTGT ATCAGAATAT ACAGCTTCTA ATTTTCGTGA 120
GTATCTTCGC CACACTGAGG AATTTGATTT GCAGTTTATA TTTCAACTGT GTAAAATTCA 180
CTTAACTCCT GAAATTATGG CCTACTTGCA CAATATGAAT AAGGCCTTAT TGGATGACTG 240
GAATTTTGGT GTGGTGCCTC CTCCTTCTAC CAGTTTGGAT GATACCTATA GGTTTTTGCA 300
GTCTCGTGCC ATTACCTGTC AAAAGGGGGC TGCCACCCCT CCTCCTAAAG AAGATCCATA 360
TGCTAACTTA TCCTTTTGGA CTGTGGATTT AAAGGACAAA TTTTCCACTG ACTTG 415
(SEQ ID NO: 680);

HPV 74 1613 - 2027/415 bp
TATTTGTTGG GGTAATCAAT TATTTGTTAC AGTTGTGGAT ACCACACGCA GTACTAACAT 60
GACTGTGTGT GCTCCTACCT CACAATCGCC TTCTGCTACA TATAATAGTT CAGACTACAA 120
ACAATACATG CGACATGTGG AGGAATTTGA TTTGCAATTT ATTTTTCAAT TATGTAGTAT 180
TAAGTTAACT GCTGAGGTTA TGGCCTATAT TCATACTATG AATCCTACAG TTTTAGAAGA 240
GTGGAACTTT GGGCTAACGC CTCCCCCCAA TGGTACTTTA GAAGACACCT ACAGATATGT 300
GCAGTCCCAG GCTATTACAT GTCAAAAACC TACGCCTGAT AAAGCAAAGC CCAATCCCTA 360
TGCAAATTTA AGTTTTTGGG AAGTTAATCT TAAGGAAAAG TTTTCTAGTG AATTA 415
(SEQ ID NO: 681);

HPV 82 6536 - 6950/415 bp
CATTTGCTGG AATAATCAGC TTTTTATTAC TTGTGTTGAC ACTACTAAAA GTACCAATTT 60
AACCATTAGC ACTGCTGTTA CTCCATCTGT TGCACAAACA TTTACTCCAG CAAACTTTAA 120
GCAGTACATT AGGCATGGGG AAGAATATGA ATTGCAATTT ATATTTCAAT TGTGTAAAAT 180
CACTTTAACT ACTGAAATTA TGGCTTACCT GCACACCATG GATTCTACAA TTTTAGAACA 240
GTGGAATTTT GGATTAACAT TGCCCCCCTC CGCTAGTTTG GAGGATGCCT ATCGATTTGT 300
AAAAAATGCA GCAACATCCT GTCACAAGGA CAGTCCTCCA CAGGCTAAAG AAGACCCTTT 360
GGCAAAATAT AAATTTTGGA ATGTAGACCT TAAGGAACGC TTTTCTTTGG ATTTG 415
(SEQ ID NO: 682);

HPV CP8061 21 - 432/412 bp
CATTTGTTGG GGCAATCAGC TTTTTGTAAC AGTTGTGGAC ACATCACGTA GTACAAATAT 60
GTCCATCTGT GCTACCAAAA CTGTTGAGTC TACATATAAA GCCTCTAGTT TCATGGAATA 120
TTTGAGACAT GGAGAAGAAT TTGATTTGCA ATTTATATTT CAACTATGTG TTATTAATTT 180
AACAGCTGAA ATTATGGCCT ACTTACATCG CATGGATGCT ACATTACTGG AGGACTGGAA 240

TTTTTGGTTC TTACCACCTC CTACTGCTAG TCTTGGTGAT ACCTACCGCT TTTTACAGTC 300
TCAGGCCATA ACCTGTCAGA AAAACAGTCC TCCTCCTGCA GAAAAAAAGG ACCCCTATGC 360
AGATCTTACA TTTTGGGAGG TGGATTTAAA GGAGCGGTTT TCACTAGAAT TG 412
(SEQ ID NO: 683);

HPV CP8304 21 - 432/412 bp
TATTTGTTGG TTTAATGAAA TGTTTGTTAC AGTGGTGGAT ACTACCAGAA GCACCAATTT 60
TACTATTTGC ACAGCTACAT CTGCTGCTGC AGAATACAAG GCCTCTAACT TTAAGGAATT 120
TCTGCGCCAT ACAGAGGAAT ATGATTTGCA GTTTATTTTC CAATTATGTA AAATACAGTT 180
AACACCAGAA ATTATGGCCT ACTTACATAA TATGAACAAG GCACTGTTGG ATGATTGGAA 240
TTTTGGTGTG TTGCCACCTC CTTCCACCAG TTTAGATGAC ACATATCGCT TTTTACAGTC 300
TCGGGCCATT ACCTGTCAAA AGGGTGCTGC TGCCCCTGCG CCCAAAGAGG ACCCTTATGC 360
CGACATGTCA TTTTGGACAG TTGACCTTAA GGACAAGTTG TCTACTGATT TG 412
(SEQ ID NO: 684);

HPV L1AE5 11 - 360/350 bp
GGCACAACCA ATTATTTATA ACTGTGGTAG ACACAACACG TAGTACCAAT CTTACCTTAT 60
CTACTGCAAC TACTAATCCA GTTCCATCTA TATATGAACC TTCTAAATTT AAGGAATACA 120
CACGCCATGT AGAGGAATAT GATTTACAAT TTATATTTCA ATTGTGTAAA ATTACACTTA 180
CTACTGATGT TATGTCTTAT ATACATAACA TGGATCCTAC TATTTTAGAT AGTTGGAATT 240
TTGGTGTTAG TCCTCCCCCA TCTGCTAGCT TAGTAGATAC ATATAGGTTT TTACAGTCAT 300
CTGCCATTAC ATGTCAGAAG GATGTGGTTG TTCCACAAAA AAAGGATCCA 350
(SEQ ID NO: 685);

HPV MM4 21 - 435/415 bp
CATTTGCTGG AATAATCAGC TTTTTATTAC TTGTGTTGAC ACTACTAGAA GTACCAATTT 60
AACCATTAGC ACTGCTGTTA CTCAATCTGT TGCACAAACA TTTACTCCAG CAAACTTTAA 120
GCAATACATT AGGCATGGGG AAGAATATGA ATTGCAATTT ATATTTCAAT TGTGTAAAAT 180
CACTTTAACT ACTGAAATTA TGGCTTACCT GCACACCATG GATTCTACAA TTTTAGAACA 240
GTGGAATTTT GGATTAACCT TGCCCCCCTC AGCTAGTTTG GAGGATGCCT ATCGATTTGT 300
AAAAAATGCA GCAACATCCT GTCACAAGGA CAGTCCTCCA CAGGCTAAAC AAGACCCTTT 360
GGCAAAATAT AAATTTTGGA ATGTAGACCT TAAGGAACGC TTTTCTTTGG ATTTG 415
(SEQ ID NO: 686);

HPV MM7 21 - 432/412 bp
CATTTGTTGG TTTAATGAGT TATTTGTTAC AGTTGTAGAT ACTACCCGCA GTACCAATAT 60
TACTATTTCA GCTGCTGCTA CACAGGCTAA TGAATACACA GCCTCTAACT TTAAGGAATA 120
CCTCCGCCAC ACCGAGGAAT ATGACTTACA GGTTATATTG CAACTTTGCA AAATACATCT 180
TACCCCTGAA ATTATGGCAT ACCTACATAG TATGAATGAA CATTTATTGG ATGAGTGGAA 240
TTTTGGCGTG TTACCACCTC CTTCCACCAG CCTTGATGAT ACCTATCGCT ATCTGCAGTC 300
CCGTGCTATT ACCTGCCAAA AGGGTCCTTC CGCCCCTGCC CCTAAAAAGG ATCCTTATGA 360
TGGCCTTGTA TTTTGGGAGG TTGATTTAAA GGACAAACTA TCCACAGATT TG 412
(SEQ ID NO: 687); AND

HPV MM8 21 - 432/412 bp
TATATGCTGG TTTAATCAAT TGTTTGTCAC GGTGGTGGAT ACCACCCGCA GCACCAATTT 60
TACTATTAGT GCTGCTACCA ACACCGAATC AGAATATAAA CCTACCAATT TTAAGGAATA 120
CCTAAGACAT GTGGAGGAAT ATGATTTGCA GTTTATATTC CAGTTGTGTA AGGTCCGTCT 180
GACTCCAGAG GTCATGTCCT ATTTACATAC TATGAATGAC TCCTTATTAG ATGAGTGGAA 240
TTTTGGTGTT GTGCCCCCTC CCTCCACAAG TTTAGATGAT ACCTATAGGT ACTTGCAGTC 300
TCGCGCCATT ACTTGCCAAA AGGGGGCCGC CGCCGCCAAG CCTAAGGAAG ATCCTTATGC 360
TGGCATGTCC TTTTGGGATG TAGATTTAAA GGACAAGTTT TCTACTGATT TG 412
(SEQ ID NO: 688).

Respectfully submitted,

By: Tang-Yuan Chu

Date: 2/14/2003

DR. TANG-YUAN CHU